

SUBSTITUTE SPECIFICATION

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Title: A FEEDING AND/OR DRINKING COLUMN ON  
BEHALF OF ANIMALS

RELATED APPLICATIONS:

This is a Continuation of International Application No.  
PCT/NL99/00791, filed December 21, 1999.

FIELD OF INVENTION:

The invention relates to a column for feeding or drinking or both by animals, such as cows, said column comprising a central axis surrounded by several reservoirs and feeding troughs, as well as at least one metering device for dosing feed or liquid from at least one of the reservoirs to at least one of the feeding troughs.

BACKGROUND OF THE INVENTION:

A disadvantage of known constructions is the size of the feeding or drinking column as a result of which the latter occupies much space in the shed. Furthermore, its construction is costly because components are used that are quite variable, depending on the number of animals to be fed and the specific wishes of the user.

SUMMARY OF THE INVENTION:

An object of the present invention is to obviate the above drawbacks. For such purpose the column feeding or drinking or both is provided with a framework located around a central axis, to which framework primarily the feeding troughs and reservoirs are

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fitted. In this manner the construction occupies little space. Compactness may be increased in that a cross-section of the framework perpendicular to the central axis is substantially circular. There is also obtained a great accessibility of the feeding troughs in that the circumference of the feeding column is substantially circular. This makes it possible for the livestock to reach the feeding troughs easily from all directions. In this manner the capacity of the column for feeding or drinking or both can be utilized as efficiently as possible.

The column is providing with partitions disposed between the feeding troughs and having such dimensions that they prevent the animals from disturbing each other during eating or drinking, or from eating one another's feed. In this manner the animals are able to eat quietly, without being distracted by animals in the vicinity of the feeding troughs. The shortest distance between two adjacent partitions equals approximately the width of the outside of the feeding trough. Thus there is again achieved a great compactness of the feeding column. In a preferred embodiment of the invention, the number of partitions equals the number of feeding troughs.

The column in accordance with the invention can be easily be assembled because the components fitted to the framework are detachable. One or more components can be disassembled without tools being used, so that they can easily be fitted to the framework and be removed therefrom. The aforementioned components comprise a partition or a reservoir or a feeding trough or a

combination thereof. Finally a component may also comprise a metering device. In this manner the column can easily be adapted to the user's wishes. Exchanging components is also very simple and the column's capacity can be utilized optimally and efficiently.

The components of at least one subset of components are similar in shape. Because of the fact that the column of the invention consists of uniform components, said components can be produced in large numbers, whereby production costs remain low.

In the preferred embodiment of the invention a storage room is located above the feeding troughs. As a result thereof a separate drive unit for transporting the feed is not required, as the gravitational force causes the feed to flow from the storage room to the feeding troughs. The metering device is preferably located in the middle of a cross-section perpendicular to the central axis of the framework so as to be able easily to serve the feeding troughs. Due to the fact that the reservoirs are almost contiguous they occupy little space. For the purpose of filling the reservoirs, the latter are provided with an opening for filling. The feeding troughs are almost contiguous as well, so that a maximum number of feeding troughs can be disposed along the circumference of the column. In a preferred embodiment of the invention, the number of feeding troughs equals the maximum number of animals to be fed that are able to position themselves side by side along the circumference formed by the totality of feeding troughs.

In a preferred embodiment of the invention, at a specific radius of the circular circumference of the framework the number of feeding troughs for feeding cows is twelve.

According to another inventive feature, the column is provided with at least one weighing device which is suitable for being used in a feeding trough or a metering device on both. By means of said weighing device it is possible to regulate the amount of feed in the metering device or the feeding trough or both. At least part of the weighing device is in particular movable about a central axis. Therefore, one or more weighing devices that can be used both for the metering device and for the one or more feeding troughs, will suffice. This has advantage that the cost of several weighing devices can be saved.

According to an inventive feature, the metering device is disposed between at least one reservoir and at least one feeding trough. In this manner it is achieved that the feed flows by gravitational force from a reservoir via the metering device to the feeding trough, so that separate drive means are not required. The metering device comprises at least one storage room, so that the feed or the ingredients thereof are not directly supplied to a feeding trough. The metering device may also comprise mixing means for mixing the material present in the storage room. The animals are thus prevented from eating selectively only specific feed ingredients. In a preferred embodiment of the invention, the metering device is movable about a central axis, and in particular rotatable about its central axis, so that it is possible to serve

several feeding troughs by means of the metering device. To that end, according to an inventive feature, for moving the metering device the latter is provided with a drive unit.

In accordance with the invention, the feeding column of the invention further comprises removing means for removing substances that are unfit for consumption from the flow of feed. In this manner undesired feed ingredients, such as metal objects and plastics, can be removed from the feed. The removing means comprise at least one magnet or at least one electromagnet or at least one reel or any combination thereof. With the reel it is possible to remove metal objects from the flow of feed by means of eddy currents.

The column in accordance with the invention is provided with identification means for identifying an individual animal, while the column is capable of operating fully automatically. According to an inventive feature, before the animals are fed by means of the column, the individual animal is identified, after which, by means of the metering device, the feed is composed of ingredients emanating from one or more reservoirs, according to the nutritive needs of the individual animal, and the feed is supplied to the feeding trough. By means of a weighing device in the metering device, the amount of feed corresponds to the nutritive needs of the individual animal. In accordance with another inventive feature, during pouring the feed in to a feeding trough, the amount of feed is correlated to the nutritive needs of the individual animal by means of a weighing device. Finally the amount of feed

can also be made to correspond to the nutritive needs of the individual animal by means of a weighing device in a feeding trough. Depending on the location of one or more weighing devices in the column and the assembly of the various components of the column, various configurations of various components are possible, while in the various configurations the weight of the feed supplied can each time be determined.

By means of a weighing device, which is in connection with the feeding trough, the eating speed of an animal is determined and the value thereof is subsequently stored in a computer memory. The nutritive needs of the individual animal are determined with the aid of one or more values stored in a computer memory and relate to the eating speed of the individual animal. The eating speed of an animal having greater nutritive needs will be considerably higher than that of an animal having small nutritive needs. The small nutritive needs may result for example from an animal's illness. Thus, the eating speed also relates to the animal's condition. According to a last inventive feature, the feed that has not been consumed by the individual animal is automatically removed from the feeding trough with the aid of removing means.

#### **BRIEF DESCRIPTION OF THE DRAWINGS:**

The invention will now be explained in further detail with reference to the figures.

Figure 1 is a side elevational view of the framework for the invention column provided with a storage room;

Figure 2 is a plan view of the framework according to cross-

section taken on lines II-II in Figure 1;

Figure 3 is a broken vertical cross-sectional view of a column for feeding or drinking or both in accordance with the invention;

Figure 4 is a plan view of the column of the invention provided with several reservoirs.

**DETAILED DESCRIPTION OF THE PREFERRED INVENTION:**

In the embodiment shown in Figure 1, a framework 1 has a substantially circular circumference. At the upper side of framework 1 is a storage room 2 consisting of several reservoirs 3. On framework 1 facilities are provided for placing reservoirs 3.

Framework 1 is also provided with partitions 4 which are detachably arranged on framework 1. Framework 1 is preferably designed as a steel tubular construction.

Figure 2 is a cross-section taken on line II-II of Figure 1. Framework 1 is divided into three segments per quarter. In this embodiment, a total of twelve cows can be fed at the same time.

Figure 3 is a vertical cross-section of the feeding column in accordance with the invention, showing framework 1, reservoirs 3, partitions 4, a metering device 5 which may be provided, if desired, with a storage room, feeding troughs 6, identification means 7 and a drive unit 8 for metering device 5. Because of the cylindrical geometry of the column the constructive occupies little space, while the column is optimally accessible to the animals from all directions. In metering device 5 there is disposed an electromagnet 9 by means of which metal objects are removed from

the flow of feed.

Figure 4 is a plan view of the column of the invention showing reservoirs 3 with filling apertures 10, framework 1 and partitions 4.

Although I have disclosed the preferred embodiments of my invention, it will be understood by those skilled in the art that it is capable of other adaptations and modifications within the scope of the following claims.

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